CLAIMS

1. Use of a porous silicon-based catalytic system for the conversion of a light olefin feedstock into oligomer paraffins, having from about 10 to about 20 carbon atoms, characterised in that said porous silicon-based catalytic system has an average pore diameter of between about 1 nm and about 5 nm and an acidity level of between about 150 µmol/g and about 650 µmol/g, and prepared from at least one hydrolysable silicon-based compound, or other source of silicon, and at least one non-ionic surface active agent, wherein the concentration of the non-ionic surface active agent in the catalyst preparation medium is in the range of 15 to 25 wt %.

2. Use according to claim 1, for the conversion of a light olefin feedstock into oligomer paraffins belonging to the diesel fractions (boiling point 180-350 °C).

3. Use according to any of the preceding claims, characterised in that the porous silicon-based catalytic system is chosen from aluminosilicate, zirconiosilicate, borosilicate, phosphosilicate, phosphoaluminosilicate, boro-aluminosilicate and zirconio-aluminosilicate based materials.

4. Use according to any of the preceding claims, characterised in that the porous silicon-based catalytic system is chosen from aluminosilicate, borosilicate, boro-aluminosilicate and zirconio-aluminosilicate based materials.

5. Use according to any of the preceding claims, characterised in that the porous silicon-based catalytic system is an aluminosilicate-based porous material.

6. Use according to any of the preceding claims, characterised in that the porous silicon-based catalytic system is an aluminosilicate-based porous material having a Si/Al molar ratio of between about 5 and about 40, preferably about 10 and about 20.

7. Use according to any of the preceding claims, characterised in that the porous silicon-based catalytic system is an aluminosilicate-based porous material having a Si/Al molar ratio of about 15.

8. Use according to any of the preceding claims, characterised in that the porous silicon-based catalytic system has an acidity level of between about 300 µmol/g and about 500 µmol/g.

9. Use according to any of the preceding claims, characterised in that the catalytic system comprises an aluminosilicate-based porous catalytic support, prepared with a non-ionic surface-active agent, and optionally at least one catalytic material with one or more of the following characteristics taken alone or in combination:

- the Si/Al molar ratio is comprised between about 5 and about 40, preferably about 10 and about 35;
- the average diameter of the pores has a value from about 1 nm to about 5 nm;
- the catalytic material optionally comprises one or more metals chosen from platinum and rhodium, alone or in mixtures, in an overall amount of between 0.05 % and 5 % by weight, and more preferably between 0.1 % and 2 % by weight of the catalytic support.

10. Use according to any of the preceding claims, characterised in that the catalytic system is an aluminosilicate-based porous material prepared from at least one non-ionic surface-active agent and having a Si/Al molar ratio of 15.

11. Use according to any of claims 1 to 10, characterised in that the porous catalytic system is substantially free from further catalytic metal.

12. Use according to any of claims 1 to 10, characterised in that the porous catalytic system further comprises one or more catalytic metals chosen from groups 8, 9 and 10 of the periodic classification of the elements.

13. Use according to claim 12, characterised in that the porous catalytic system further comprises one or more catalytic metals chosen from nickel, rhodium, and platinum.

14. Use according to any of claims 11 or 12, characterised in that the porous catalytic system further comprises one or more metals chosen from rhodium and platinum.

15. Use according to any of claims 11 to 14, characterised in that the amount of metal(s) is comprised between 0.01 % and 10 % by weight of the porous support, preferably between 0.05 % and 5 % by weight, and more preferably between 0.1 % and 2 % by weight.

16. Use according to any of claims 11 to 15, characterised in that the catalytic system is an aluminosilicate-based porous material prepared from at least one non-ionic surface-active agent and having a Si/Al molar ratio of 15 and comprising 0.2 % of rhodium.

17. Use according to any of claims 11 to 15, characterised in that the catalytic system is an aluminosilicate-based porous material prepared from at least one non-ionic surface-active agent and having a Si/Al molar ratio of 15 and comprising 0.2 % of platinum.

18. Use according to any of claims 11 to 15, characterised in that the catalytic system is an aluminosilicate-based porous material prepared from at least one non-ionic surface-active agent and having a Si/Al molar ratio of 15 and comprising 0.2 % by weight of a mixture rhodium/platinum in a 3/1 molar ratio.

19. Use according to any of the preceding claims, characterised in that said light olefin feedstock comprises alkenes or mixtures of alkenes, in all proportions, chosen from among C_2-C_6 alkenes or any olefin-comprising hydrocarbon mixtures.

20. Porous silicon-based catalytic system substantially free from catalytic metal, and having an average pore diameter comprised between about 1 nm and about 5 nm, an acidity level of between about 150 µmol/g and about 650 µmol/g, and prepared from at least one hydrolysable silicon-based compound, or other source of silicon, and at least one non-ionic surface active agent, wherein the concentration of the non-ionic surface active agent in the catalyst preparation medium is in the range of 15 to 25 wt %.

21. Catalytic system according to claim 20 consisting essentially of aluminosilicates, borosilicates, zirconio-aluminosilicates or boro-aluminosilicates.

22. Catalytic system according to any of claim 20 or 21, consisting essentially of aluminosilicate, and having one or more of the following characteristics taken alone or in combination:

a. the average pore diameter is comprised between about 1 nm and about 5 nm;
b. the acidity level is comprised between about 300 µmol/g and about 500 µmol/g;
c. the Si/Al molar ratio is of about 15;
d. the preparation of which involves at least one hydrolysable silicon-based compound, or other source of silicon, and at least one non-ionic surface active agent.

23. Catalytic system according to any of claims 20 to 22, consisting essentially of an aluminosilicate having a Si/Al molar ratio comprised between about 5 and about 40, preferably about 10 and about 20.

24. Catalytic system according to claim 23 wherein the Si/Al molar ratio is about 15.

25. Process for the conversion of a light olefin feedstock into oligomer paraffins, having from about 10 to about 20 carbon atoms, characterised in that it comprises the following reaction steps:

a) said olefin feedstock is contacted with a porous silicon-based catalytic system having an average pore diameter of between about 1 nm and about 5 nm and an acidity level of between about 150 µmol/g and about 650 µmol/g, and prepared from at least one hydrolysable silicon-based compound, or other source of silicon, and at least one non-ionic surface active agent;

b) the reaction is run at a temperature ranging from about 100 °C to about 350 °C, and at a pressure comprised between about 0.5 MPa and about 7 MPa;

c) the final products are removed from the reaction medium and collected.

26. Process according to claim 25, for the conversion of a light olefin feedstock into oligomer paraffins belonging to the diesel fractions (boiling point 180-350 °C).

27. Process according to any of claims 25 or 26, characterised in that the porous silicon-based catalytic system is chosen from aluminosilicate, zirconiosilicate, borosilicate, phosphosilicate, phosphoaluminosilicate, boro-aluminosilicate and zirconio-aluminosilicate based materials.

28. Process according to any of claims 25 to 27, characterised in that the porous silicon-based catalytic system is chosen from aluminosilicate, borosilicate, aluminoborosilicate and aluminozirconiosilicate based materials.

29. Process according to any of claims 25 to 28, characterised in that the porous silicon-based catalytic system is an aluminosilicate-based porous material.

30. Process according to any of claims 25 to 29, characterised in that the porous silicon-based catalytic system is an aluminosilicate-based porous material having a Si/Al molar ratio of between about 5 and about 40, preferably about 10 and about 20.

31. Process according to any of claims 25 to 30, characterised in that the porous silicon-based catalytic system is an aluminosilicate-based porous material having a Si/Al molar ratio of about 15.

32. Process according to any of claims 25 to 30, characterised in that the porous silicon-based catalytic system has an acidity level comprised between about 300 µmol/g and about 500 µmol/g.

33. Process according to any of claims 25 to 32, characterised in that the catalytic system comprises an aluminosilicate-based porous catalytic support, prepared with a non-ionic surface-active agent, and optionally at least one catalytic material with one or more of the following characteristics taken alone or in combination:

- the Si/Al molar ratio is comprised between about 5 and about 40, preferably about 10 and about 35;
- the average diameter of the pores has a value from about 1 nm to about 5 nm;
- the catalytic material optionally comprises one or more metals chosen from platinum and rhodium, alone or in mixtures, in an overall amount of between 0.05 % and 5 % by weight, and more preferably between 0.1 % and 2 % by weight of the catalytic support;
- the acidity level is comprised between about 300 µmol/g and about 500 µmol/g.

34. Process according to any of claims 25 to 33, characterised in that the catalytic system is an aluminosilicate-based porous material prepared from at least one non-ionic surface-active agent and having a Si/Al molar ratio of 15.

35. Process according to any of claims 25 to 34, characterised in that the porous catalytic system is substantially free from further catalytic metal.

36. Process according to any of claims 25 to 34, characterised in that the porous catalytic system further comprises one or more catalytic metals chosen from groups 8, 9 and 10 of the periodic classification of the elements.

37. Process according to claim 36, characterised in that the porous catalytic system further comprises one or more catalytic metals chosen from nickel, rhodium, and platinum.

38. Process according to any of claims 36 or 37, characterised in that the porous catalytic system further comprises one or more metals chosen from rhodium and platinum.

39. Process according to any of claims 36 to 38, characterised in that the amount of metal(s) is comprised between 0.01 % and 10 % by weight of the porous support, preferably between 0.05 % and 5 % by weight, and more preferably between 0.1 % and 2 % by weight.

40. Process according to any of claims 36 to 39, characterised in that the catalytic system is an aluminosilicate-based porous material prepared from at least one non-ionic surface-active agent and having a Si/Al molar ratio of 15 and comprising 0.2 % of rhodium.

41. Process according to any of claims 36 to 39, characterised in that the catalytic system is an aluminosilicate-based porous material prepared from at least one non-ionic surface-active agent and having a Si/Al molar ratio of 15 and comprising 0.2 % of platinum.

42. Process according to any of claims 36 to 39, characterised in that the catalytic system is an aluminosilicate-based porous material prepared from at least one non-ionic surface-active agent and having a Si/Al molar ratio of 15 and comprising 0.2 % by weight of a mixture rhodium/platinum in a 3/1 molar ratio.

43. Process according to any of claims 25 to 42, characterised in that said light olefin feedstock comprises alkenes or mixtures of alkenes, in all proportions, chosen from among C_2-C_6 alkenes or any olefin-comprising hydrocarbon mixtures.

44. Process according to claim 43, characterised in that said alkenes or mixtures of alkenes are chosen from among ethene, propene, butenes (i.e. all linear or branched butene isomers: 1-butene, 2-butene, 2-methylpropene), pentenes (all linear or branched isomers) and hexenes (all linear or branched isomers).

45. Process according to any of claims 43 or 44, characterised in that said alkenes or mixtures of alkenes are chosen from among C_4 and C_5 alkenes.

46. Process according to any of claims 25 to 45, characterised in that the reaction temperature is comprised between 100 °C and 350 °C, more preferably between about 200 °C and about 250 °C.

47. Process according to any of claims 25 to 46, characterised in that the reaction pressure is comprised between 0.5 MPa and 7 MPa, preferably about 5 MPa.

48. Diesel fractions compounds substantially obtained by the process according to any of claims 25 to 47.